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WHAT IS CLAIMED IS:

1. An apparatus for automatically changing a tool tip member for a robot, said robot operating in the condition that said tool tip member is threadedly mounted on a tool body mounted on a robot arm, said apparatus comprising:

a tip member changing jig disposed in an operational area of said robot;

a controller for controlling operation of said robot;

said tip member changing jig including a base member, a rotating member rotatably supported by said base member about a rotation axis, and tip member holding means for holding said tip member and disposed at a position that is offset from said rotation axis of said rotating member; and

said tip member holding means adapted to hold said tool tip member so that a central axis of relative rotation, for threadedly mounting the tool tip member on said tool body, extends substantially parallel to said rotation axis and rotation of said tool tip member, with respect to said rotating member, is locked.

2. The apparatus according to claim 1, wherein said controller controls the operation of said robot arm of said robot to move said tool body around said rotation axis while keeping said tool body in contact with said tool tip member held by said tip member holding means, thereby to rotate said rotating member about said rotation axis while bringing about the relative rotation between said tool body and said tool tip member so as to demount or mount said tool tip member from or to said tool body.

3. The apparatus according to claim 1, wherein said rotating member is provided with means for detecting a rotational phase.

4. The apparatus according to claim 1, wherein said tip member holding means has a rotation locking

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member for locking the relative rotation of said tool tip member with respect to said tip member holding means and said rotation locking member is supported on said rotating member via elastic element.

5 5. The apparatus according to claim 4, wherein said rotation locking member is supported on said rotating member so as to allow said rotation locking member to rotate about its axis when a torque larger than a predetermined value is exerted on said rotation locking member in the rotation direction.

10 6. The apparatus according to claim 4, wherein said rotation locking member includes a cylindrical portion formed with a receiving hole for receiving said tool tip member, so that said tool tip member is
15 demounted or mounted from or on said tool body while said tool tip member being inserted into said receiving hole.

 7. The apparatus according to claim 6, wherein a cylindrical outer tool tip member is further attached to said tool body so as to encircle the periphery of said
20 tool tip member with a gap, and wherein an outer diameter of the cylindrical portion of said rotation locking member is smaller than an inner diameter of said outer tool tip member so that the inner tool tip member disposed inside said outer tool tip member can be changed
25 while said outside tool tip member being mounted on said tool body.

 8. The apparatus according to claim 7, wherein said rotating member is provided with tool cleaning means for cleaning both or either one of said inner tool tip member and said outer tool tip member.

30 9. The robot tool tip member automatic changing apparatus according to claim 8, wherein said tool cleaning means includes a cylindrical element and said controller controls the operation of said robot arm to
35 move said tool body around said rotation axis with said cylindrical element inserted between said outside tool tip member and said inside tool tip member, thereby to

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bring about relative rotation between said cylindrical
element of said tool cleaning means and said inner and
outer tool tip members so as to clean both or either one
of said inner tool tip member and said outer tool tip
5 member.

10. The apparatus according to claim 9, wherein
said robot comprises an arc welding robot, said tool body
comprises an arc torch provided with a nozzle as said
outer tool tip member, said inner tool tip member
10 comprises a contact tip, and said tool cleaning means
comprises nozzle cleaning means.